SERVICE MANUAL

FISHER

FM-7000

AM/FM Stereo Tuner

(EUROPE)

The first name in high fidelity

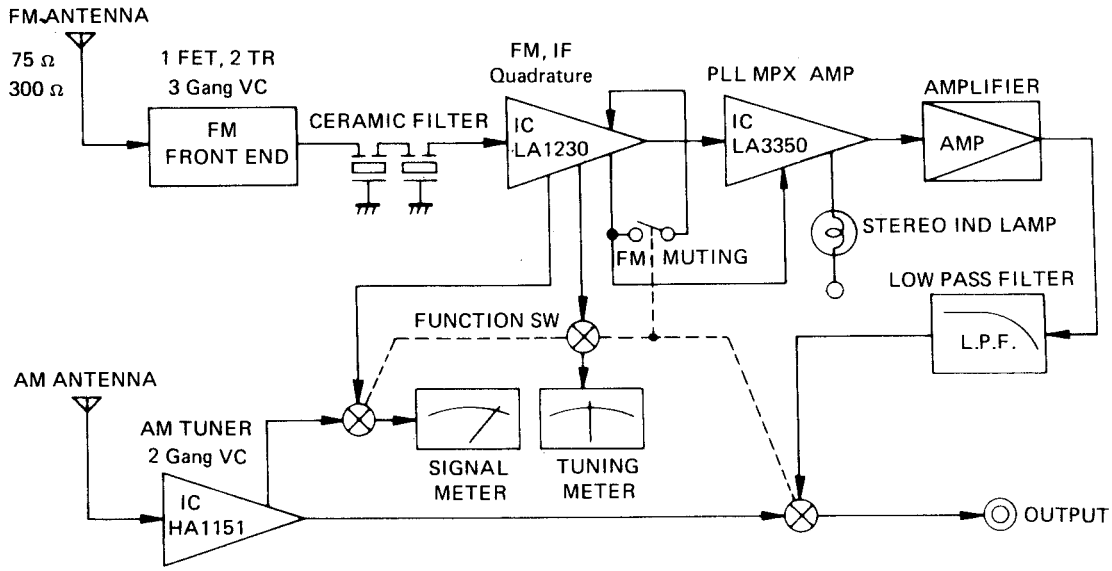
Nominal Specifications For Information Only.

AM/FM STEREO TUNER	FM-7000
FM SECTION	
Frequency Range	88 - 108 MHz
Sensitivity (DIN)	1.9 μV
Image Frequency Rejection Ratio	60 dB
IF Rejection	80 dB
AM Suppression	50 dB
Capture Ratio	1.0 dB
Selectivity (DIN)	60 dB
Signal to Noise Ratio	65 dB (MONO)
Harmonic Distortion	0.18 % (MONO)
Channel Separation	40 dB (400 Hz)
Antenna Impedance	300 ohms, 75 ohms
AM SECTION	
Frequency Range	525 - 1,605 kHz
Sensitivity (bar antenna)	300 μV/m
Image Frequency Rejection Ratio	45 dB
IF Rejection	35 dB
Selectivity	35 dB
Signal to Noise Ratio	55 dB
Distortion	0.5 %
GENERAL	
* Power Source	AC: 110/220V, 50 Hz
Power Consumption	13 W
Dimensions (W) x (H) x (D)	450 x 135 x 265 mm
Weight	4.0 kg (approx.)

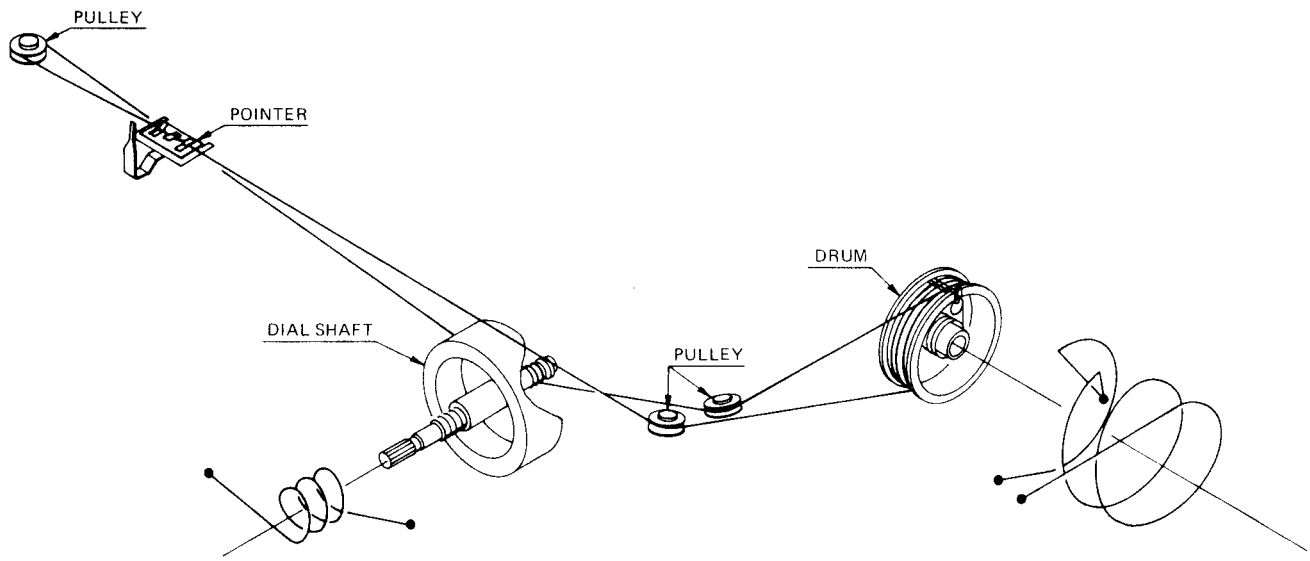
Because Fisher products are subject to continuous improvement, Fisher reserves the right to modify, change, or alter any design or specifications without notice and without incurring any obligation. Fisher reserves the right to make changes and improvements upon its products without any obligation to install such changes upon any of its products previously manufactured.

NOTE:
Change over the voltage selector inside the unit to either 110V or 220V.

FUNCTIONAL BLOCK DIAGRAM



DIAL CORD STRINGING

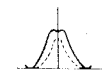


NOTE: Check to see that the dial cord is correctly strung by turning the dial.

AM-FM MULTIPLEX ALIGNMENT

AM ALIGNMENT

For Alignment: Maintain generator output as low as possible for suitable indication.

Step	Adjusting circuit	Connection		Position of tuning dial	Adjustment	V.T.V.M. Oscilloscope
		Input	Output			
1	IF	Connect 455 kHz sweep generator to VC 4.	Connect oscilloscope to test point TP 30.	Near max. capacity of VC at position of on interference	AM IFT 9-20970	 455 kHz
2	RF	Connect AM generator to EXT AM ANT and GND terminals. Set to 600 kHz. Modulate with 30 %, 1 kHz.	Connect oscilloscope and AC. V.T.V.M. to Test Point TP 30.	600 kHz	AM ANT 2-00130 AM OSC 9-20851	Max.
3		Change frequency to 1400 kHz.		1400 kHz	TC4 TC5	Max.
4	Repeat adjustments.					

1. Variable capacitor completely closed
2. Set the dial pointer to very left line dial scale.
3. Connect sweep generator, SG,V.T.V.M. and oscilloscope.
4. Function switch to "AM"
5. Use a screwdriver with plastic grip for all adjustment.

FM ALIGNMENT

Step	Adjusting circuit	Connection		Position of Tuning dial	Adjustment	V.T.V.M. Oscilloscope
		Input	Output			
1	IF	Connect sweep 10.7 MHz generator to test point VC 2 through 0.01 μF.	Connect oscilloscope to test point TP 17.	Near max. capacity of VC.at position of on Interference	FM IFT 9-21360	10.7 MHz
2	Quadrature Detector		Connect oscilloscope to test point TP 18.		FM QUADRA TURE COIL 9-21320	
3	RF	Connect FM RF generator through two 120-ohm resistors to FM ANT screw terminals. Set generator to 90 MHz, modulate with 400 Hz to provide ±75 kHz deviation. Set generator output attenuator as low as possible.	Connect V.T.V.M. to Tuner Output.	90 MHz	FM ANT COIL 9-21180 FM RF COIL 9-20460 FM OSC COIL 9-20910	Max.
4		Change generator setting to 106 MHz.	Connect V.T.V.M. to Tuner Output..	106 MHz	TC 1 TC 2	Max.
5	Repeat adjustments.					

1. Variable capacitor compeltely closed
2. Set the dial pointer to very left line of dial scale.
3. Connect sweep generator, FM SG, V.T.V.M. and oscilloscope. FM ANT input impedance is 300 ohm.
4. Function switch to "FM"
5. Use a screwdriver with plastic grip for all adjustments.

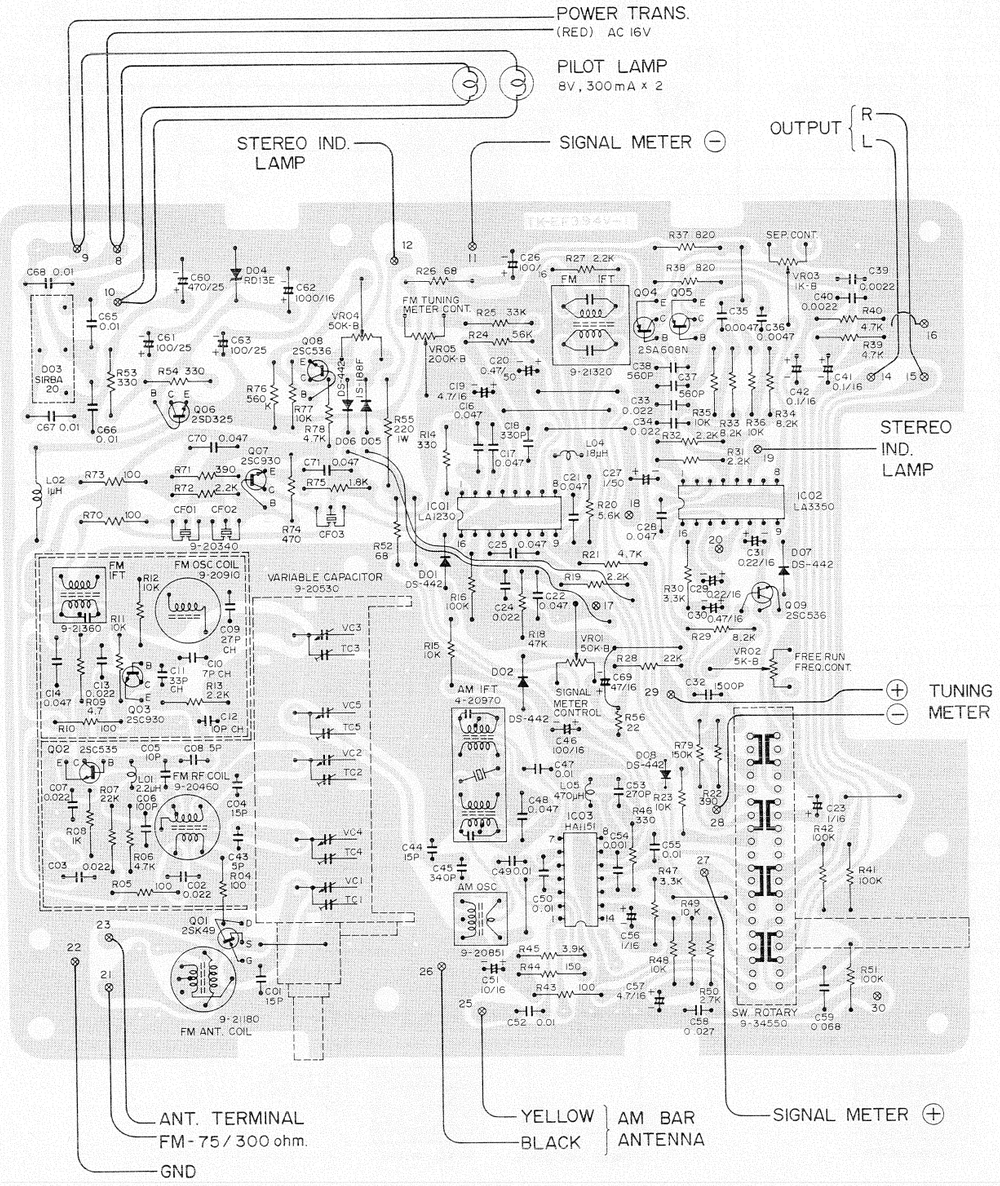
FM MPX ALIGNMENT

Step	Adjusting circuit	Connection		Position of tuning dial	Adjustment	
		Input	Output			
1	PLL IC FO (19 kHz) Adjustment	None	Connect Frequency counter or synchroscope to TP 20.	Near max. capacity of VC. at position of on interference	Adjust VR 02 (5k-B) so that frequency counter or synchroscope indicate 19 kHz	
2	FM STEREO Signal Separation	As above Steps 3,4 except modulation Modulate LEFT channel ±67.5 kHz – 400 Hz audio and ±7.5 kHz – 19 kHz pilot carrier. As above except modulate RIGHT Channel.	Connect V.T.V.M. to output terminal (R channel).		VR 03 (1k-B)	V.T.V.M. Min.
			Connect V.T.V.M. to output terminal (L channel).			
3	Repeat steps 1,2. Set at position with max. channel separation.					

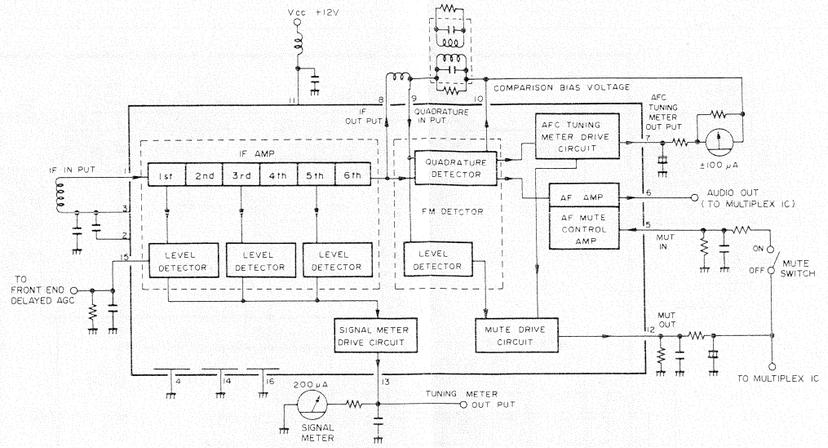
1. Variable capacitor completely closed
2. Connect FM stereo SG and V.T.V.M.
3. Function switch to "FM"
4. Use a screwdriver with plastic grip for all adjustments.

PRINTED CIRCUIT BOARD

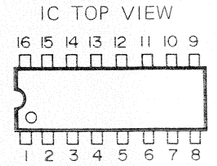
(BOTTOM VIEW)



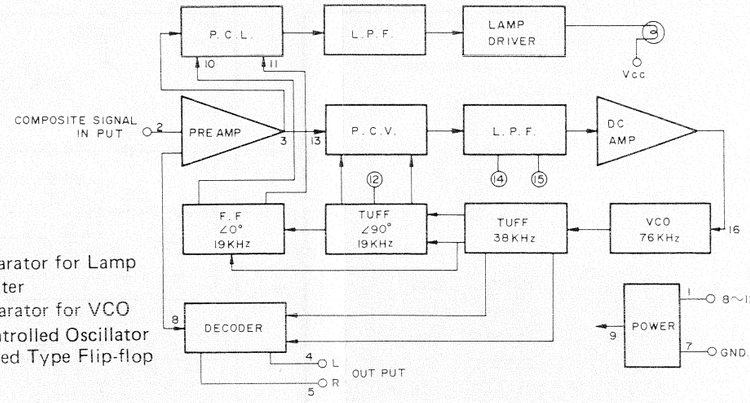
FM IF IC LA1230 SIGNAL FLOW



IC TOP VIEW

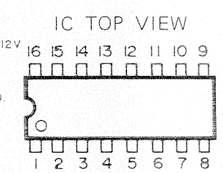


FM MPX IC LA3350 SIGNAL FLOW

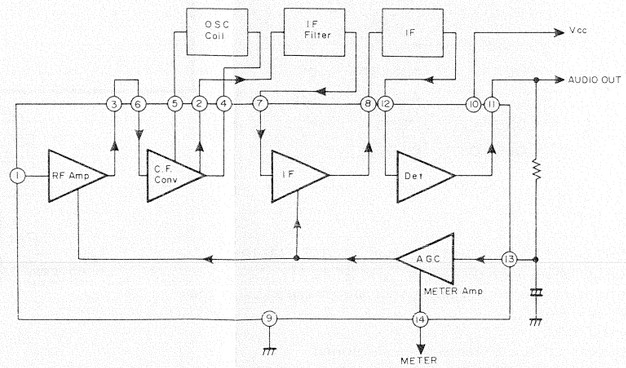


P. C. L. : Phase Comparator for Lamp
L. P. F. : Low Pass Filter
P. C. V. : Phase Comparator for VCO
V C O : Voltage Controlled Oscillator
TUFF : Direct coupled Type Flip-flop

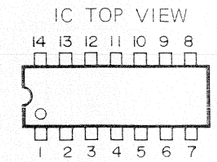
IC TOP VIEW



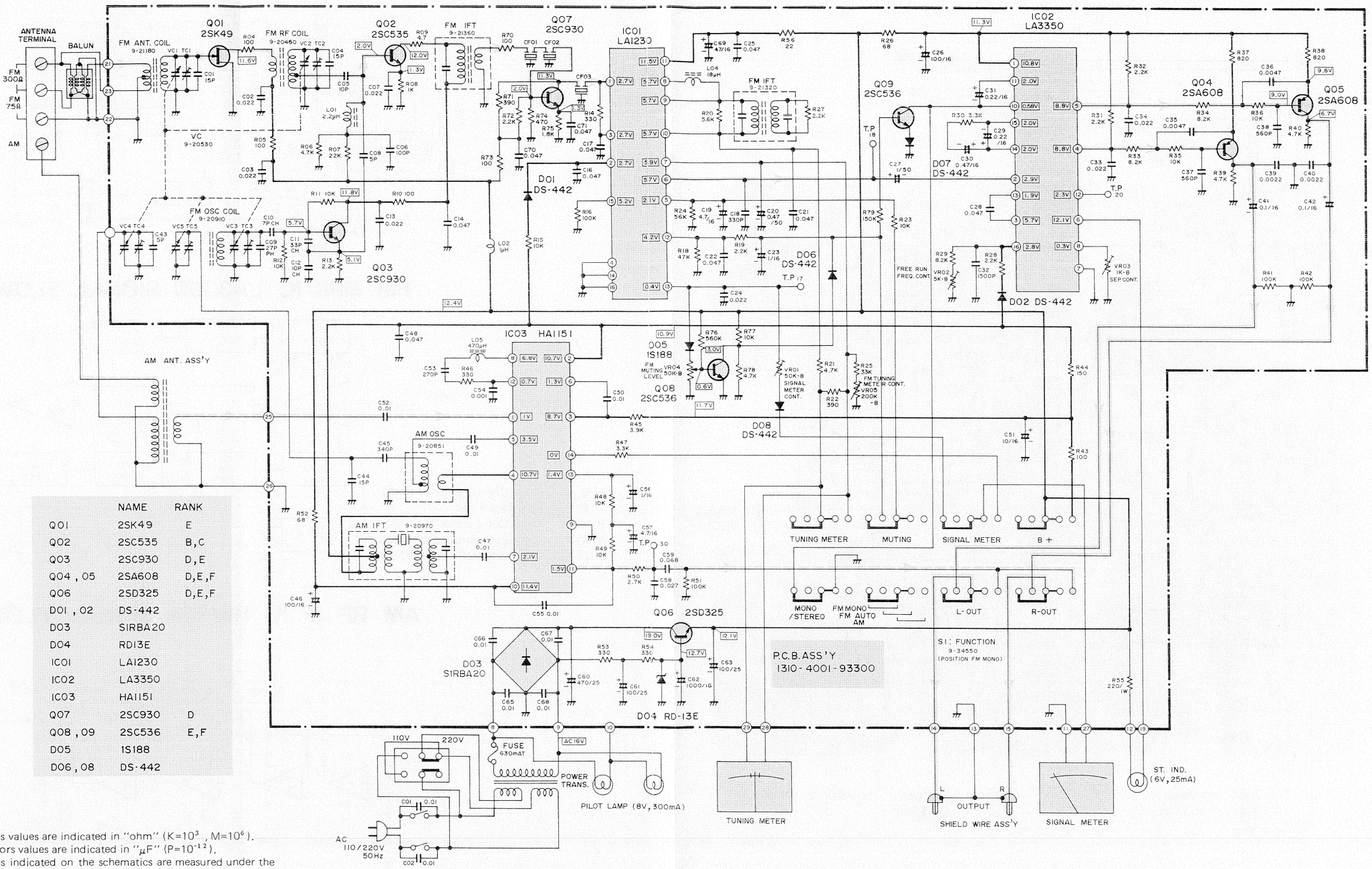
AM RF IF IC HA1151 SIGNAL FLOW



IC TOP VIEW



SCHEMATIC DIAGRAM

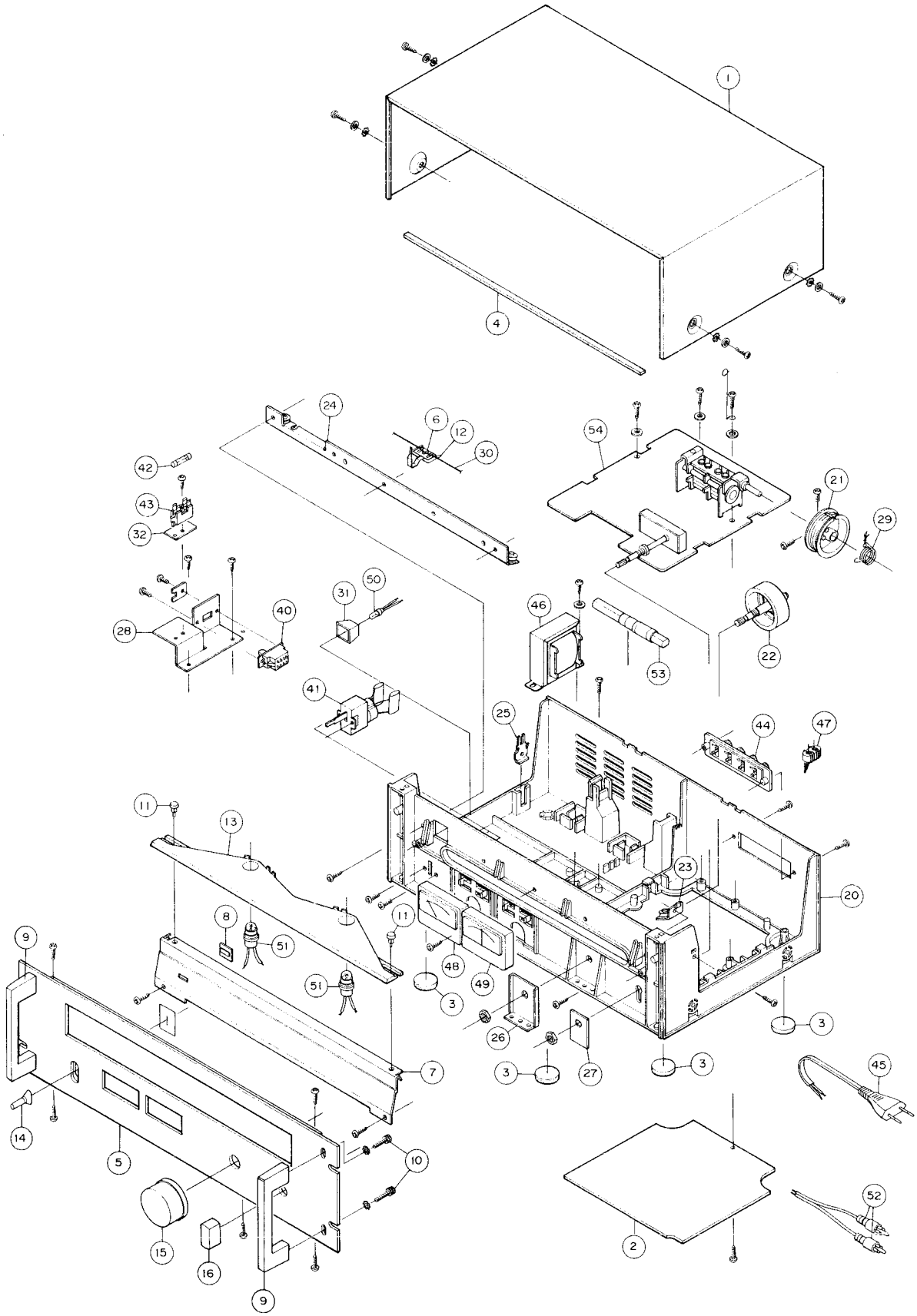


	NAME	RANK
Q01	2SK49	E
Q02	2SC535	B,C
Q03	2SC930	D,E
Q04 , 05	2SA608	D,E,F
Q06	2SD325	D,E,F
D01 , 02	DS-442	
D03	SIRBA20	
D04	RD13E	
IC01	LA1230	
IC02	LA3350	
IC03	HA1151	
Q07	2SC930	D
Q08 , 09	2SC536	E,F
D05	1S188	
D06 , 08	DS-442	

NOTES:

1. All resistors values are indicated in "ohm" (K=10^3 , M=10^6).
2. All capacitors values are indicated in "μF" (P=10^{-12}).
3. All voltages indicated on the schematics are measured under the following conditions.
   a. Use a V.T.V.M.
   b. All voltages ±10% with respect chassis ground
   c. No signals at input terminals
   d. AC input at 220 volts 50Hz
4. This is fundamental schematics diagram. Some products may be modified without notice.

EXPLODED VIEW OF CABINET AND CHASSIS



PARTS LIST

PACKING PARTS LIST

Ref. No.	Parts Number	Description
	131 6 1139 63804	Box Corrugate-EXP
	131 6 2119 01441	Bag Polyethylene-EXP (Set)
	131 6 3009 23580	Pad (Bottom, Top)

ACCESSORIES PARTS LIST

Ref. No.	Parts Number	Description
	4 2449 20230	Antenna FM
	131 6 4119 69000	Explanatory Booklet (English, French, German)
	131 6 4519 14700	Guarantee Certificate

CABINET PARTS LIST

Ref. No.		Parts Number	Description
1		131 2 1410 16500	Cover
2		131 2 1105 19000	Plate Bottom
3		131 2 1801 13900	Leg
4	*	131 2 5205 15300	Cushion

APPEARANCE PARTS LIST

Ref. No.		Parts Number	Description
5		131 0 1016 27601	Panel, Decorative Assy
6		131 0 3011 17700	Pointer Assy
7		131 2 1201 29802	Plate Dial
8		131 2 1503 12600	Decorate Sign
9		131 2 1701 12200	Handle
10		131 2 4201 18600	Screw
11		131 2 4221 00400	Rivet
12	*	131 2 5205 17600	Cushion
13		131 2 6308 16900	Filter
14		131 0 1001 37604	Knob Assy (Lever SW)
15		131 0 1001 42401	Knob Assy (Tuning)
16		131 0 1001 42500	Knob Assy (Function)

CHASSIS PARTS LIST

Ref. No.		Parts Number	Description
20	*	131 2 3301 22501	Chassis
21		131 0 3002 11300	Drum Assy
22		131 0 3003 19500	Shaft Dial Assy
23	*	131 0 3020 08900	Pulley Assy
24	*	131 0 3020 09000	Pulley Assy
25	*	131 2 3101 45800	Metal Mount
26	*	131 2 3101 46000	Metal Mount (Shaft Dial Assy)
27	*	131 2 3101 46100	Metal Mount (Function Switch)
28	*	131 2 3101 54000	Metal Mount (Fuse Holder)
29		131 2 4111 00400	Spring Rope
30		131 2 4112 10200	Dial Cord
31		131 2 6111 20900	Housing (Stereo Ind)
32	*	131 2 7103 20916	Label (Fuse 630mAT)

ELECTRICAL PARTS LIST

Ref. No.		Parts Number	Description
40		4 2319 21531	Switch Slide, 110 - 220V Select
41		4 2319 24382	Switch Lever, Power Switch
42		4 2349 20400	Fuse 0.63A, Secondary
43		4 2359 21021	Fuse Holder
44		4 2379 21920	Antenna Terminal
45	*	4 2439 20521	Power Cord
46		4 2512 02220	Power Transformer 110V/220V
47		4 2599 20300	Balum 75 ohm/300 ohm
48		4 5119 20780	Meter Signal
49		4 5119 20790	Meter Tuning
50		4 6129 20665	Small Lamp 6V 25mA Stereo Ind
51		4 6129 20771	Pilot Lamp 8V 300mA
52		131 0 4004 15100	Wire Shield Assy
53		131 0 4012 00130	MW Antenna Assy
C01,02		C2EHRM103A	Metalised Paper 0.01 μF 250V ±20%
54	*	131 0 4001 93300	Printed Circuit Board Assy

* —Not a service part

PRINTED CIRCUIT BOARD Assy
1310 4001 93300

Ref. No.	Parts Number	Description
	4 2249 20530	Variable Capacitor
CF01,02 03	4 2279 20340	Ceramic Filter, FM IF
	4 2319 34550	Switch Rotary Function
L01	4 2539 20420	Choke Coil 2.2 μH
L02	4 2539 20120	IF Trap 1 μH
L04	4 2532 00030	Choke Coil 18 μH
L05	4 2539 20410	Choke Coil 470 μH
	4 2569 20970	IF Transformer AM
	4 2569 21320	IF Transformer FM
	4 2569 21360	IF Transformer FM
	4 2579 21180	Antenna Coil FM
	4 2589 20851	OSC Coil AM
	4 2589 20910	OSC Coil FM
	4 2599 20460	RF Coil FM
VR01	4 2229 25400	VR 50k-B
VR02	4 2229 22842	VR 5k-B
VR03	4 2229 24210	VR 1k-B
VR04	4 2229 25400	VR 50k-B
VR05	4 2229 26150	VR 200k-B

CAPASITORS

C01	C1HCSJ150SL	Ceramic	15 pF	50V	±5%
C02,03	C1HYSZ223A	Ceramic	0.022 μF	50V	+80,–20%
C04	C1HCSJ150SL	Ceramic	15 pF	50V	±5%
C05	C1HSCD100SL	Ceramic	10 pF	50V	±0.5%
C06	C1HCSK101SL	Ceramic	100 pF	50V	±10%
C07	C1HYSZ223A	Ceramic	0.022 μF	50V	+80,–20%
C08	C1HCSC050SL	Ceramic	5 pF	50V	±0.25%
C09	C1HCSK270PH	Ceramic	27 pF	50V	±10%
C10	C1HCSD070CH	Ceramic	7 pF	50V	±0.5%
C11	C1HCSK330CH	Ceramic	33 pF	50V	±10%
C12	C1HCSD100CH	Ceramic	10 pF	50V	±0.5%
C13	C1HYSZ223A	Ceramic	0.022 μF	50V	+80,–20%
C14,16 17	C1HYSZ473A	Ceramic	0.047 μF	50V	+80,–20%

PARTS LIST

Ref. No.	Parts Number	Description
	CAPACITORS	
C18	C1HCSK331SL	Ceramic 330 pF 50V ±10%
C19	C1CRB-475A	Electrolytic 4.7 μF 16V
C20	C1HRB-474A	Electrolytic 0.47 μF 50V
C21,22	C1HYSZ473A	Ceramic 0.047 μF 50V +80,–20%
C23	C1CRB-105A	Electrolytic 1 μF 16V
C24	C1HYSZ223A	Ceramic 0.022 μF 50V +80,–20%
C25	C1HYSZ473A	Ceramic 0.047 μF 50V +80,–20%
C26	C1CRB-107A	Electrolytic 100 μF 16V
C27	C1HRE-105AL	Electrolytic 1 μF 50V
C28	C1HFAM473A	Mylar 0.047 μF 50V ±20%
C29	C1CUBX224A	Sint. Alu. 0.22 μF 16V +40,–20%
C30	C1CUBX474A	Sint. Alu. 0.47 μF 16V +40,–20%
C31	C1CUBX224A	Sint. Alu. 0.22 μF 16V +40,–20%
C32	C1HSEJ152A	Styrol 1500 pF 50V ±5%
C33,34	C1HFAM223A	Mylar 0.022 μF 50V ±20%
C35,36	C1HFAM472A	Mylar 0.0047 μF 50V ±20%
C37,38	C1HYSK561R	Ceramic 560 pF 50V ±10%
C39,40	C1HFAM222A	Mylar 0.0022 μF 50V ±20%
C41,42	C1CUBX104A	Sint. Alu. 0.1 μF 16V +40,–20%
C43	C1HCSC050SL	Ceramic 5 pF 50V ±0.25%
C44	C1HCSJ150WK	Ceramic 15 pF 50V ±5%
C45	C1HSEJ341A	Styrol 340 pF 50V ±5%
C46	C1CRB-107A	Electrolytic 100 μF 16V
C47	C1HFAM103A	Mylar 0.01 μF 50V ±20%
C48	C1HYSZ473A	Ceramic 0.047 μF 50V +80,–20%
C49,50	C1HFAM103A	Mylar 0.01 μF 50V ±20%
C51	C1CRB-106A	Electrolytic 10 μF 16V
C52	C1HFAM103A	Mylar 0.01 μF 50V ±20%
C53	C1HCSK271SL	Ceramic 270 pF 50V ±10%
C54	C1HYSZ102A	Ceramic 0.001 μF 50V +80,–20%
C55	C1HFAM103A	Mylar 0.01 μF 50V ±20%
C56	C1CRB-105A	Electrolytic 1 μF 16V
C57	C1CRB-475A	Electrolytic 4.7 μF 16V
C58	C1HFAM273A	Mylar 0.027 μF 50V ±20%
C59	C1HFAM683A	Mylar 0.068 μF 50V ±20%
C60	C1ERB-477A	Electrolytic 470 μF 25V
C61	C1ERB-107A	Electrolytic 100 μF 25V
C62	C1CRB-108A	Electrolytic 1000 μF 16V
C63	C1ERB-107A	Electrolytic 100 μF 25V
C65,66 67,68	C2HYDP103A	Ceramic 0.01 μF 500V +100,–0%
C69	C1CRB-476A	Electrolytic 47 μF 16V
C70,71	C1HYSZ473A	Ceramic 0.047 μF 50V +80,–20%
	SEMICONDUCTORS	
D01,02	205 5 9040 44210	Diode DS-442
D03	DDD-S1RBA20	Diode S1RBA20
D04	DNN-RD13E	Diode RD-13E
D05	202 5 9110 18820	Diode 1S188FM1
D06,07 08	205 5 9040 44210	Diode DS-442
IC01	206 5 0151 23010	IC LA1230
IC02	206 5 0743 35012	IC LA3350 PLL for MPX
IC03	IKK-HA1151	IC, HA1151
Q01	TNN-2SK49--F2	FET 2SK49 F2
Q02	TKK-2SC535--B	TR 2SC535 B, C
Q03	203 5 5500 93040	TR 2SC930 D, E
Q04,05	203 5 7230 60840	TR 2SA608NP D
Q06	203 5 8210 32540	TR 2SC325
Q07	203 5 5500 93040	TR 2SC930 D
Q08,09	203 5 5100 53650	TR 2SC536 E, F

Ref. No.	Parts Number	Description			
	RESISTORS				
R04,05	R2EDZJ101APA	Carbon	100	1/4W	±5%
R06	R2EDZJ472APA	Carbon	4.7k	1/4W	±5%
R07	R2EDZJ223APA	Carbon	22k	1/4W	±5%
R08	R2EDZJ102APA	Carbon	1k	1/4W	±5%
R09	R2EDZJ4R7APA	Carbon	4.7	1/4W	±5%
R10	R2EDZJ101APA	Carbon	100	1/4W	±5%
R11,12	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R13	R2EDZJ222APA	Carbon	2.2k	1/4W	±5%
R14	R2EDZJ331APA	Carbon	330	1/4W	±5%
R15	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R16	R2EDZJ104APA	Carbon	100k	1/4W	±5%
R18	R2EDZJ473APA	Carbon	47k	1/4W	±5%
R19	R2EDZJ222APA	Carbon	2.2k	1/4W	±5%
R20	R2EDZJ562APA	Carbon	5.6k	1/4W	±5%
R21	R2EDZJ472APA	Carbon	4.7k	1/4W	±5%
R22	R2EDZJ391APA	Carbon	390	1/4W	±5%
R23	R2EDZJ103APA	Carobn	10k	1/4W	±5%
R24	R2EDZJ563APA	Carbon	56k	1/4W	±5%
R25	R2EDZJ333APA	Carbon	33k	1/4W	±5%
R26	R2EDPJ680A	Carbon	68	1/4W	±5%
R27,28	R2EDZJ222APA	Carbon	2.2k	1/4W	±5%
R29	R2EDZJ822APA	Carbon	8.2k	1/4W	±5%
R30	R2EDZJ332APA	Carbon	3.3k	1/4W	±5%
R31,32	R2EDZJ222APA	Carbon	2.2k	1/4W	±5%
R33,34	R2EDZJ822APA	Carbon	8.2k	1/4W	±5%
R35,36	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R37,38	R2EDZJ821APA	Carbon	820	1/4W	±5%
R39,40	R2EDZJ472APA	Carbon	4.7k	1/4W	±5%
R41,42	R2EDZJ104APA	Carbon	100k	1/4W	±5%
R43	R2EDZJ101APA	Carbon	100	1/4W	±5%
R44	R2EDZJ151APA	Carbon	150	1/4W	±5%
R45	R2EDZJ392APA	Carbon	3.9k	1/4W	±5%
R46	R2EDZJ331APA	Carbon	330	1/4W	±5%
R47	R2EDZJ332APA	Carbon	3.3k	1/4W	±5%
R48,49	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R50	R2EDZJ272APA	Carbon	2.7k	1/4W	±5%
R51	R2EDZJ104APA	Carbon	100k	1/4W	±5%
R52	R2EDPJ680A	Carbon	68	1/4W	±5%
R53,54	R2EDZJ331APA	Carbon	330	1/4W	±5%
R55	R3AXBJ221A	Oxide Metal Film	220	1W	±5%
R56	R2EDUJ220A	Carbon	22	1/4W	±5%
R70	R2EDZJ101APA	Carbon	100	1/4W	±5%
R71	R2EDZJ391APA	Carbon	390	1/4W	±5%
R72	R2EDZJ222APA	Carbon	2.2k	1/4W	±5%
R73	R2EDPJ101A	Carbon	100	1/4W	±5%
R74	R2EDZJ471APA	Carbon	470	1/4W	±5%
R75	R2EDZJ182APA	Carbon	1.8k	1/4W	±5%
R76	R2EDZJ564APA	Carbon	560k	1/4W	±5%
R77	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R78	R2EDZJ472APA	Carbon	4.7k	1/4W	±5%
R79	R2EDZJ154APA	Carbon	150k	1/4W	±5%